NON-PUBLIC?: N
ACCESSION #: 9112260303
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Donald C. Cook Nuclear Plant - Unit 2 PAGE: 1 OF 03

DOCKET NUMBER: 05000316

TITLE: Reactor Protection System Actuation Due to Low-Low Steam Generator Level When Steam Pressure Increased from Main Turbine Control Valve Closure
EVENT DATE: 11/15/91 LER #: 91-010-00 REPORT DATE: 12/16/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: P. F. Carteaux - Safety and Assessment Superintendent TELEPHONE: (616) 465-5901

COMPONENT FAILURE DESCRIPTION:
CAUSE: E SYSTEM: TG COMPONENT: ISV MANUFACTURER: H037
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On November 15, 1991 at 1113 hours, the Unit 2 reactor tripped as a result of a low-low Steam Generator (SG) water level in SG #21. Prior to the reactor trip, instrumentation was being installed on the main turbine control fluid circuit. The purpose of this instrument was to investigate oscillations of control valve A which was scheduled to be tested later that evening. A pressure indicator which measures the output of the turbine operating device was to be isolated and another transmitter was to be installed in parallel to it. However, unknown to personnel involved, worn threads on the stem of the manual isolation valve prevented the pressure indicator from being completely isolated. As a drain plug was removed to vent pressure from the instrument isolation valve, pressure on the output of the operating device was also decreased. This effectively lowered the setpoint supplied to the speed governor,

which compares actual turbine speed to the operating device setpoint, and fully closed the high pressure and low pressure turbine control valves. With the steam supply isolated, SG pressure rapidly increased and caused SG level to decrease below the reactor trip setpoint.

The root valve's bonnet was replaced and damaged stem threads were repaired. During the outage, repairs were also completed to reduce the turbine load swings experienced during valve testing. A review of the work control process will be performed to identify any enhancements that can be added to reduce the probability of an unplanned actuation occurring from similar activities in the future. Any change indicated by the review will be implemented by March 30, 1992.

END OF ABSTRACT

Conditions Prior to Occurrence

Unit 2 in Mode 1 at 100 percent of Rated Thermal Power (RTP).

Description of Event

On November 15, 1991 at 1113 hours, the Unit 2 reactor (EIIS/JE) tripped as a result of a low-low steam generator water level in SG #21. Prior to the reactor trip, instrumentation was being installed on the main turbine control fluid circuit (EIIS/TA-PC). The purpose of these instruments was to investigate oscillations of control valve A which was scheduled to be tested later that evening. A pressure indicator (LPI-15) which measures the output of the turbine operating device was to be isolated and another transmitter was to be installed in parallel to LPI-15. However, unknown to personnel involved, worn threads on the stem of the manual instrument isolation valve (EIIS/TG-ISV) prevented LPI-15 from being completely isolated. As a drain plug was being removed to vent pressure from the instrument isolation valve of LPI-15, pressure on the output of the operating device was also decreased. This effectively lowered the setpoint supplied to the speed governor, which compares actual turbine speed to the operating device setpoint, and fully closed the high pressure and low pressure turbine control valves.

With the steam supply isolated, SG pressure rapidly increased and caused SG level to rapidly decrease below the reactor trip setpoint. The reactor trip signal was generated approximately 5 seconds after the high pressure control valves were closed.

Following the reactor trip/turbine trip sequence, opening of the reactor

trip breakers (EIIS/JE-BKR), insertion of reactor control rods (EIIS/AA-ROD), feedwater isolation (EIIS/JB), and automatic starting of the motor-driven and turbine-driven auxiliary feedwater pumps (EIIS/BA-P), Operations personnel immediately implemented Emergency Operating Procedure 2 OHP 4023.E-0 to verify proper response of the Automatic Protection System and to assess plant conditions for appropriate recovery actions.

As seen on previous trips, 3 of 4 main steam isolation valves (EIIS/SB-ISV) drifted off their open detents. MRV 230 drifted fully closed and MRV 210 and 220 drifted to intermediate positions. All valves were manually reopened. The highest SG pressure recorded was 1010 psig. An investigation into the cause of this valve drifting problem is ongoing.

A spurious reactor coolant letdown isolation also occurred at the time of the trip. Occasional, spurious letdown isolations have been experienced over the past year and the cause has not yet been determined. Operators returned letdown to service without incident. Although letdown isolations have little safety significance, they do provide a distraction to the Control Room operations and investigation into the root cause is ongoing.

Cause of Event

The cause of the event was a defective instrument isolation valve failing to provide isolation to a pressure indicator in the main turbine control fluid circuit. The loss of control fluid pressure resulted in closure of all turbine control valves which led to a rapid increase in steam pressure and a resulting decrease in steam generator water levels and the reactor trip.

Analysis of Event

This report is being submitted in accordance with 10CFR50.73, paragraph (a)(2)(iv), as an event that resulted in an unplanned automatic actuation of the Engineered Safety Features, including the Reactor Protection System.

The automatic protection responses, including reactor trip and its associated actuations were verified to have functioned properly as a result of the reactor trip signal. The reactor coolant letdown isolation valves were reopened, and the Main Steam Isolation Valves which drifted shut were reopened within minutes of the trip. Based on the above, it is

concluded that the event did not constitute an unreviewed safety question as defined in 10CFR50.59(a)(2) nor did it adversely impact the health and safety of the public.

Corrective Actions

The instrument isolation valve for LPI-15 was disassembled and inspected. The valve bonnet was replaced due to a loose handle on the stem, which may have damaged the threads. After burro on the threads were removed, the valve stroked freely.

During the outage, the servo cam-disk for turbine control valves A and D was inspected by a vendor representative and found to be out of position. The cam-disk was repositioned on control valves A and D, which changed the opening characteristics of the valves, and decreased the amount of load swings during control valve testing.

A review of the work control process will be performed to identify any enhancements that can be added to reduce the probability of an unplanned actuation occurring from similar activities in the future. Any change indicated by the review will be implemented by March 30, 1992.

Failed Component Identification

Component description: Main Turbine Control Fluid Pressure Setpoint Indicator Transmitter Isolation Shutoff Valve

Plant designation: 2-LPI-15-II

Manufacturer: Dresser Industries, Inc., Hancock Valve Division

Model: 8130W

EIIS Code: TG-ISV

Previous Similar Events

None

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106

616 465 5901

INDIANA
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December 16, 1991

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses
DPR-74 Docket No. 50-316

Document Control Man
ger:

In accordance with the criteria established by 10 CFR 50.59 entitled Licensee Event Report System, the following report is being submitted:

91-010-00

Sincerely,

A. A. Blind
Plant Manager

AAB:sb

Attachment

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